

What is claimed is:

Sub A2

1. A method for fabricating a CMOS image sensor having a plurality of unit pixels, comprising:

5 a) providing a semiconductor structure having a photodiode on a semiconductor substrate;

b) forming an insulating layer covering the semiconductor structure including the photodiode;

10 c) forming a dielectric layer having hydrogen over the insulting layer;

d) diffusing hydrogen ions from the dielectric layer into the photodiode; and

e) removing the dielectric layer.

15 2. The method as recited in claim 1, wherein the step of forming a dielectric layer includes forming it with a material selected from a group consisting of silicon oxide ( $\text{SiO}_x$ ), silicon nitride ( $\text{SiN}_x$ ), silicon oxide nitride ( $\text{SiO}_x\text{N}_y$ ) and  $\text{Si}_3\text{N}_4$ .

20 3. The method as recited in claim 2, wherein the step of forming a dielectric layer includes plasma enhanced chemical vapor deposition (PECVD).

25 4. The method as recited in claim 1, wherein the step of diffusing hydrogen ions includes thermal treatment.

